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ABSTRACT

This paper presents three research studies. The first study investigated the use of boys' and girls' play areas, each stocked with sex-type toys, by day care children with male, female, or mixed teacher teams. Examined were the sex of play areas users and the effect of sex of teacher team on the structure of play in each play area. The second study considered the effects of men and women teacher teams on day care children's performance on tests of cognitive skill, cognitive style, and conservation of gender identity. Measurement involved the use of subtests from conventional intelligence tests, the Boy-Girl Identity Task, and tests of impulsivity-reflectivity. The third study sought to evaluate sex-typed classification of school objects by children in classes with teachers differing in sex. The study attempted to ascertain whether sex-typed attitudes were present at entry into the classroom and whether a year's exposure to men or women teachers affected their classification. Subjects for all three studies were 59 4-year-old preschool children attending a day care center in a working class community and nine teachers (five females and four males). The findings of each research project are discussed and illustrated with data tables. (SDH)

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Final Report

Project No. 1-A-039
Grant No. OEG-1-71-0019(509)

THE EFFECT OF PRE-SCHOOL TEACHER'S SEX ON CHILDREN'S COGNITIVE GROWTH AND SEXUAL IDENTITY

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August , 1972

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ABSTRACT

Preschool children from poor families were assigned ramdomly to three classrooms at a day care center. One class was led by men teachers, and one by a team of two women and one man. Each class included an area containing boys' toys and a second area containing girls' toys. Samples of play in these areas were video-taped twice during the year. From these tapes, child and teacher presence, sex-typing of play, and the structure of play were coded. In addition, tests of intellectual skill, cognitive style and sex-typing of school objects were administered.

It was clear, both from their play behavior and test performance, that poor children first entering a school setting both understood and played in accordance with the culture's sex-typing of activities and objects. Teacher teams had the effect of increasing area use and social play for children of the opposite sex. In addition, children opposite in sex to their teacher "crossed over" more to play in the area sex-typed like their teachers.

Boys did better than girls on all measures on intellectual skill, particularly linguistic skill. Early in the year most children believed that school objects were primarily for children of their own sex, but by the end of the year many had switched to considering them appropriate for both sexes. However, despite a significant decline in two classes, judgements that school objects were appropriate for girls increased in the female teacher's class.

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PREFACE

This research project was applied for and carried out for two reasons. We firmly believe that educational programs should be concerned with more than maintenance; they can and should become a medium for innovative experiments enabling us to work more effectively with small children.

Since our program does employ more male teachers than most preschool programs we provide the appropriate environment to study the effect of males occupying non-traditional roles on the emotional and learning lines of small children.

We wish to thank Dr. Richard Mc Cann for encouraging us and making this study possible; Dr. Ned Meuller and Barbara Cooper who worked many extra hours and with great enthusiasm.

August 1972

Marie H. Galvin

Director Headstart/Daycare

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INTRODUCTION

Part I. The Use of Boys' and Girls' Play Areas by Day Care Children with Male, Female, or Mixed Teacher Teams.

Part I of this report compares the use of a play area containing boys' toys with a play area containing girls' toys in each of three day care classrooms. One class was conducted by men teachers, one by women teachers and one by teachers of each sex. In addition, this section describes the research setting, and provides the essential data necessary for interpreting later sections of the report. It also provides the background data for analysing the effect of sex of teacher team on child dependency, aggression and the quality of the teacher-child relationship (to be analysed, pending additional funding).

The children in the research were four-year-olds. There are several reasons for conducting this type of research with children of this age. First, men are becoming increasingly oriented to teaching careers with young children (Kyselka, 1966, Williams and Johnston, 1970). Yet despite fears that men may have deleterious effects in the role of "child's first teacher" (Mussen, Conger, and Kagan, 1969), no previous research has been conducted comparing men with women in the preschool setting. Second, the school has been characterized as a feminized and feminizing institution (McCandless, 1967). Yet no one has examined whether these trends, so in evidence in elementary school (Kagan, 1964; Lorthrop, 1971), have their origins in the first teacher-child interactions of the preschool setting.

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Third, younger children may be more influenced by adult models than are older children. While the age at which peers replace adults as primary models get lower each year in this culture (Bronfenbrenner, 1967), four-year-olds still look to adults as important sources of new behavior.

The questions to be answered first concerned the sex of play area users. For example, did men teachers restrict themselves to interacting with children around blocks and trucks? Was spontaneous preschooler's play itself sex-typed; that is, did girls stay away from the block area playing instead with dolls and kitchen utencils? This section also considers the effect of sex of teacher team on the structure of play in each play area.

METHOD

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Physical and Cultural Setting The study was conducted at a day care center in a working class community near Boston. The building was old and poorly lit, but the teachers of the center had made considerable effort to create a colorful and diversified physical setting for the children. For example, they had built a loft in each class and had used partitions to divide the rooms into different areas. There were three classrooms at the center, all of which were utilized in this research. Each class was located off a large central room where the children sometimes painted and where the cots for rest time were located. The center hours were 8 to 5 each day but some children attended for only half the day.

The director of the center was a proponent of "open-classroom" education. While the teachers were not under much pressure to adhere to this philosophy, free play was the prevalent activity in all three classes. In addition, the social boundaries between classes were not rigid; occasionally children could be found playing in other classes.

For the purposes of the study, the toys in each room were supplemented to create one area stocked with boys' toys and one area stocked with girls' toys. In each class the area with girls' toys was housed under the loft, creating a well-defined and enclosed space. The area with boys' toys was also well de-limited by crates and other partitions. For purposes of brevity alone, the areas will be called the "boys' area" and the "girls' area".

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The toys selected were all ones which had been previously considered as sex-typed by preschool age children (Hartup & Zook, 1960; Rabban, 1950). The girls' area contained dolls, a cradle, a crib, a high chair, dishes, silverware, a sink, a refrigerator and other items. The boys' area contained blocks, trucks, airplanes, a post office box, toy soldiers and other items. In referring to the areas around the center, the terms "block corner" and "doll corner" were used.

Subjects The subjects included 59 children and 9 teachers. The children were mostly between their fourth and fifth birthdays during the school year under study. At the end of the school year in May, the mean age of the boys was 4.76 years and the girls was 4.65 years. At this time about 30% had passed their fifth birthday. The children were all white; many were French-Canadien, Italien and Irish Catholic in descent. All of the children's mothers were receiving A.F.D.C. welfare payments. Eighty-six percent of the mothers reported father-absence in their homes.

There were 5 female teachers and 4 males. Except for one female aged 40, all were in their twenties. There was a mixture of high school and college graduates in all. In fact, only one teacher in each room was classified as a "teacher" and the others as "teachers' aides". In the mixed class, the female was the teacher and the male was the aide.

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Design The study examined the effect of sex of teacher team and play areas on the behavior and interaction of preschool children. There were three classes with two play areas in each class. The play areas have been described previously. One class was led by a team of three men (male teachers' class).. A second class was led by a team of three women (female teachers' class) and a third class was led by one man and two women (mixed teacher' class). However, the term "team" is used somewhat loosely here since in fact each class contained one certified teacher and one or more assistants. In considering the results of this report, it is well to remember that in the mixed class, the teacher was a woman. When at the end of the year the children in that class were asked "Who is your teacher?" none responded with only the name of the male teacher. While a few mentioned both teachers most responded with the name of the woman.

Before the school year began, the children were classified by age, sex, father presence, siblings, presence of handicaps and then assigned randomly to classes subject to the restriction that the classification categories were equated across classes.

Teacher and child behavior was filmed twice during a school year to study changes in behavior as a function of increasing exposure to teacher teams, and to sex-types play areas. The "November sample" recorded behavior at a point where the children had been exposed to the teaching teams for 2-3 months. The "May sample" recorded behavior after the children had attended the center for 8-9 months. The term "sample" in this paper always refers to these two samples of data at different points in time.

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The design of the study demanded samples of videotape of equal duration from each area of every class. Analysis of variance of the actual time recorded revealed a significant (p .01) Class by Area interaction in the total time recorded in November. Therefore, to insure samples of comparible length, all data in both the November and May samples were weighted in all analyses. Weighting factors varied from 0.85 to 1.21. As a consequence, the data represent 82.8 minutes for each play area in the November sample, and 82.3 minutes for each area in the May sample.

Method of Data Collection. All observations of behavior were based on video tape records of the boys' and girls' area in each classroom. On a given day 15 minutes of tapes was collected from each area of a given class. Taping continued in a class across consecutive school days until five 15 minute tapes had been collected from each area. The first set of video tapes was made in November and early December (November sampling period). The second set of tapes was made five months later in May (May sampling period).

The video camera was mounted on wall and monitored in a separate room. Taping was restricted to free play periods, times during which the children, at least in principle, were free to come and go from the areas as they chose. As the study focused on social interaction, a tape record was made only during times when there were at least two subjects in the play area under observation. This might include a child and a teacher or two or more children. During periods when one or no subjects were in an area, camera monitoring continued but no tape was made.

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Therefore, the video tapes themselves provide no estimate of how often the subjects used the areas. For this reason, a record was kept of the total time required to obtain each 15-minute video tape. The longer it required to collect the tape, the less the subjects were present in the area during the sampling period.

Method of Data Analysis A set of original coding categories were applied to the video tapes. Some codes ascertained group composition and the general structure of the activities in progress. Other codes, not analysed in this report, described specific behaviors of teachers and children, behaviors which were expected to be influenced by sex of teacher or sex-typing of play areas. First the unit of analysis of the study is explained. It requires close attention since it derived both from units of time and from the number of groups in an area. Then the general codes are presented. The section concludes with inter-coder reliability data.

The Unit of Analysis The primary unit of analysis was a group of children playing in an area for 30 seconds. It is called the group use unit. A child-teacher pair or a collection of five children using an area for 30 seconds would each contribute one group use unit. While the individual identity of every member of every group was not recorded, the size of each group was recorded as the relative proportion of boys and girls in each group. Using these data, it was possible to calculate just how many children of each sex were present in an area during each 30 second period. This measure is called the child use unit. Because everyone thinks of rates on the basis of one minute periods rather than 30 second periods, the data are reported on a "per minute" basis.

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Notice, however, that since data were only recorded when two or more subjects were occupying a play area, and since one use unit occurred each 30 seconds, rates of area use cannot fall below either two group use units per minute or two children per minute. The latter example would occur when a teacher-child pair was present for two 30 second intervals.

During preliminary work, the group unit of analysis was found inadequate to describe the structure of activity in an area when two non-interacting groups were present. Therefore the procedure was modified to allow each of two groups to be coded simultaneously. Thus it was possible for two group use units to occur during a single 30 second interval.

Since units of analysis do not retain the individual identity of each child, one may ask whether the data reflects the behavior of many children or only a select few who chose to use the play areas day after day. As a partial solution to this problem, a list was kept each [illegible] of every individual child using an area.

While the methods of data collection served well in recording the presence of groups of two or more, they underestimated solitary play since no record was made when one child used an area by himself. In addition, when two children played independently in an area, it might have been said that there were two groups present, each with one child. In fact only one group of size two was recorded and the play was correctly recorded as independent. Groups consisting of one child were only recorded when a larger group occupied the area at the same time or when a child was present with a teacher. Thus while some estimate of independent play can be made, it excludes play which was both independent and solitary.

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Codes Describing Group Composition, Teacher Presence, and the Structure of Play

Figure 1 includes the major codes describing group size, composition and the structure of play. For most purposes the original form of these codes proved cumbersome and categories were combined into larger units. These summary forms of the codes, and their derivation from specific categories is also shown in Figure 1.

FIGURE I

Codes Describing Group Composition, Teacher Presence, and the Structure of Play

Original Code	Summary Form
Group Size and Composition	
1. 1 boy	Boys Sex-typed Groups
2. 2 boys	
3. 3 boys	
4. 75% or more boys in groups of 4 or more	
5. 100% boys in groups of 4 or more	
6. 1 girl	Girls Sex-typed Groups
7. 2 girls	
8. 3 girls	
9. 75% or more girls in groups of 4 or more	
10. 100% girls in groups of 4 or more	
11. 1 boy, 1 girl	Mixed Sex-typed Groups
12. 2 children of one sex and one of the other	
13. Groups of 4 or more with sex ratios between 26% and 74%	

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Figure I continued,

Teacher Presence

1-3. Male One-Three (Male Teacher's Class)

4. Male Teacher Four (Mixed Teachers' Class)

Male Teachers

5-7. Female Teachers One-Three (Female Teachers' Class)

8-9. Female Teachers Four-Five (Mixed Teachers Class)

Female Teachers

10. Male Teacher voice directed toward children in area

11. Female teacher voice directed toward children in area

12. Teacher absent from area

Structure of Play

1. Independent or Parallel - the children play separately from one another, either in different activities or in the same type of activity but without interacting.

2. Associative - the children are interacting about a single activity or toy. However there is no division of roles or tasks.

3. Coordinated - role taking; an actual division of labor to complete a shared goal or to play a shared game.

4. Spontaneous play with the teacher joining in. No commands or instructions by the teacher.

5. Non-spontaneous play - the teacher directs the activities by commands or instructions; stops play.

! Only possible when teacher is in corner or when several other children are playing together apart from the specified child.

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It will be observed that groups of children and specific teachers present were recorded on separate codes.

The code describing the structure of play derives from Parten (1932). Note that when the teacher either directs play or joins in the children's play, separate categories apply. Thus the amount of group units that the teacher actively interacts with the children, as opposed to just being present, can be estimated.

Code Reliability During pretesting, the coders continued revising each code until they reached a criterion of 90 percent simple agreement on a sample of 35 30-second coding periods. However simple percent agreement fails to correct for chance agreement occurring because of a small number of categories or because only a few categories are used with any appreciable frequency.. The Index of Inter-Coder Agreement described by Scott and Wertheimer (1962) corrects for these factors, and the following reliability figures are derived using this Index. It will be remembered that simple percentage agreement always exceeds .90.

The only aspect of unitizing the data on which there was disagreement concerned the recognition of two groups to be coded in a simple corner during a given 30 second period. The Index of Inter-Coder Agreement for this decision was .82. For the codes describing Group Size, Teacher Presence, and Structure of Play the Index was 1.00, 1.00 and .83 respectively.

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A Note on Statistics Traditional measures of statistical significance are generally unapplicable to the data of Part I. Even metric-free statistics, such as chi-square, assume that every subject is represented once in the data. Of course, such an assumption is not warranted here. Therefore the results shall be simply reported without significance tests except for one instance where they are appropriate. This does not imply that the observed effects were small. Some differences in area use are of the magnitude of five or ten fold. Since this first attempt at assessing the effect of sex of teacher on preschool children involves only three classes, all results require replication with a larger sample of classes. As will be seen, the magnitude of the differences observed suggests the promise of such work.

RESULTS

First the results pertaining to area use by both children and teachers will be presented. They will be followed by the results regarding the structure of the children's play (parellel play, teacher directed play). Since the units of measure devised especially for this study, their use is best illustrated at the outset. A "child use unit" refers to the amount of use an area receives when one child was present for 30 seconds. A "group use unit" refers to the amount of use an area receives when one group of children, irrespective of size, was present for 30 seconds. Groups use units have the advantage of discriminating whether area is predominantly composed of male, female or mixed-sexed groups.

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As a specific illustration of how the child use unit is read, consult Table 1. It was found that in the male teachers' class an average of 3.9 boys used the boys' area each minute while an average of 2.3 boys used the girls' area each minute. In other words, boys spent more time in the boys' area than they did in the girls' area. The measure does not imply that boys' groups were larger in the boys' area than in the girls' area.

General Area Use. The total time required to collect each 15 minute sample of video tape in the November sample served as a measure of area use. Two way, class by sex ANOVA found no significant differences in use for classes, area or interaction. The time required to gather 15 minutes of tape in an area on given day varied from 15 to 100 minutes, but this large variability was found in all classes.

In November, the number of different individuals present during given 15 minute samples ranged from 8 to 12 with a mean of 10.1 based on a random subsample of the 15 minutes videotapes records. In the May sample, when these data were recorded for all the tapes, the range was from 5 to 14 children with means of 11.0, 8.6 and 11.1 for the male, female and mixed teachers' classes respectively. These data suggest that a large proportion of the 15 children in each class used the play areas from day to day. The results of this study do not apply merely to 3 or 4 children in each class who played in the areas by themselves.

Area Use by Boys versus Girls. The relative use of each area by the boys and girls of each class is shown in Table 1. First compare the average rate at which children used the area with same-sexed toys as opposed to the area with opposite-sexed toys.

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TABLE 1

The Average Rate at which Boys and Girls Used Each Area of Each Class (Expressed in Child Use Units per Minute)

Sex of Child	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area	Boys' Area	Girls' Area
November Sample						
Boys	3.9	2.3	6.6	5.4	5.4	4.5
Girls	3.2	5.4	0.5	1.8	2.2	4.4
May Sample						
Boys	4.6	2.8	5.3	3.3	7.2	3.3
Girls	2.9	4.8	1.7	3.3	1.6	4.2

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Both in November and in May, in every classroom, boys used the boys' area more than the girls' area and girls used the girls' area more than the boys' area. Thus it is clear that the choice of play areas was sex typed for these four-year-olds and that the sex of teacher team did not erase the preference of boys for blocks and trucks or the preference of girls for dolls and kitchens in their every day play.

The above result compares within a sex of child across play areas. How did use differ within a play area, but across sex of child? Both November and May, boys used the boys' area more than do girls in all classrooms. However the equivalent pattern did not hold for the girls' area. Only in the male teachers' classroom did girls' use the girls' area more than boys. In the other classes for the most part the use of the girls' area was about equally divided between the sexes. The exception was in the female teachers' classroom in November where boys used the girls' area considerably more than did the girls. In summary, while boys used the boys' area more than girls, girls and boys used the girls' area about equally.

Now consider the use of a given play area by children of a given sex across classes. The pattern in May was identical to that in November. At both times, with the male teacher team, boys used either area less than in other classes while girls used them more than in the other classes. In either class with female teachers present, boys used the areas more and girls used them less. In other words, teacher teams depressed area use by children of their own sex or enhanced it by children of the opposite sex or both.

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Finally it is interesting to note the relative rates at which the children "crossed over" in each class; that is how often boys used the girls' area compared to how often girls used the boys' area. In both November and May, girls crossed over more than boys in the male teachers' class, and boys crossed over more than girls in both classes with women teachers.

In summary, the patterning in these results suggests that the female and mixed teacher classrooms, in agreement with the children's perceptions of who their teacher was, may actually have been two female classrooms. Although the play areas were sex-typed the same way in all classes (in the sense of being preferred by children of one sex rather than the other), the effects of sex of teacher team were still apparent. Boys used the play areas more if they had women teachers. Girls used the play areas more if they had men teachers. In addition, children of the opposite to that of the teachers' crossed over more than did children of the same sex as the teachers'.

Area Use by Sex-Typed Groups. The relative use of each play area by sex-typed and mixed groups of children is shown in Table 2. The entire pattern of results just described for boys versus girls sex-typed groups. In addition note that in May mixed groups occurred more frequently in the girls' area in all classes.

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TABLE 2

The Average Rate at which Sex-typed Groups of Children Used Each Area of Each Class (Expressed in Group Use Units per Minute)

Sex-Typed Group	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area	Boys' Area	Girls' Area
November Sample						
Boys	1.3	0.5	2.6	1.6	1.5	0.9
Girls	0.7	1.5	0.1	0.5	0.3	0.7
Mixed	1.1	0.8	0.2	0.4	0.7	1.6
May Sample						
Boys	1.5	0.3	1.7	0.5	2.2	0.7
Girls	0.9	1.2	0.3	0.5	0.3	1.1
Mixed	0.9	1.3	1.0	1.6	0.4	0.9

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Combining the sex-typed group data from all classes, boys sex-typed groups were found to be much more numerous than girls sex-typed groups in the play areas. In November 48% of all groups were boys' groups while only 23% were girls' groups. In May the respective figures were 40% boys' groups and 25% girls' groups. These differences apply to sex-typed groups of every size. In November, for example, there were about twice as many boys' groups as girls' groups for groups of sizes 1, 2, 3, and 4. Boys play more than girls in the areas under study in this research.

Area Use by Teachers Table 3 shows the percentage of total group use units in a given area during which a given teacher was present. Individual teacher area use was quite variable within classes and across sampling periods; thus it is difficult to make generalizations. However, in spite of these variations, one pattern held both in November and May: in the male teacher class some teacher was present during use of the boys' area more than they were present during the use of the girls' area. In both other classes some teacher was present more during girls' area use than during boys' area use.

The table also shows that teacher presence in an area was almost always under 50% of the group use units. In other words, in both November and May the children played by themselves more often than they played in the immediate presence of any member of the teacher team.

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TABLE 3

Percent of Group Use Units in Each Play Area with Teacher Present in November and May Samples.

	November		May	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area
Male Teachers' Class				
Male Teacher 1	9.6	17.3	18.1	21.5
Male Teacher 2	32.4	14.4	19.8	1.3
Male Teacher 3	31.2	3.8	11.1	13.0
Total - Any Teacher	73.2	35.5	49.0	35.8
Female Teachers' Class				
Female Teacher 1	27.5	30.0	15.6	9.0
Female Teacher 2	15.2	8.9	2.9	19.4
Female Teacher 3	0	6.8	0	0
Total - Any Teacher	42.7	45.7	18.5	28.3
Mixed Teachers' Class				
Male Teacher 4	13.0	18.2	36.7	29.0
Female Teacher 4	21.1	19.8	1.5	18.8
Female Teacher 5	0	0	0	0
Total - Any Teacher	34.1	38.0	38.2	47.8

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Structure of Play Table 4 shows the percentage of play which was classified in each of the structural categories described in Figure 1. For both the November and May Samples, the vast majority of all play was either independent, associative, or teacher controlled. Coordinated play between children and play where the teacher participated without directing were never very frequent in any classroom. Both November and May, the Table shows a preponderance of associative play over independent and parellel play. The single exception, both in November and May, was the boys' area of the male teachers' class where independent and parellel play predominated. However, before the patterns in this table can be fully interpreted, it is essential to consider the structure of play broken down by each sex-typed group. Tables 5 through 7 show the relative amount of independent, associative, and coordinated play for each type of sex-typed group.

Before considering these tables it should be noted that the reported percentages are slightly confounded by amount of teacher presence in each area of each class. Obviously one of the code categories "teacher participates but does not control" could only occur when he or she was in the play area. For this reason, the categories involving teacher presence had been analysed separately. In addition the validity of results for the other categories was checked using the subsample of cases where the teacher was absent. The pattern of results to be reported was unchanged using this subsample.

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TABLE 4

Percentage of All Play Classified in each Structural Category by Area and Class

Structure of Play	Male Teachers' Class		Female Teachers' Class		Mixed Teachers Class	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area	Boys' Area	Girls' Area
	November Sample					
Independent Parallel	47.2	23.1	38.7	16.6	18.4	15.9
Associative	6.7	39.3	40.8	47.3	53.3	48.6
Coordinated	0.0	9.4	0.4	9.8	0.0	8.4
Teacher Participating but not Controlling	7.5	3.8	3.8	1.0	0.4	1.4
Teacher Controlled	38.5	24.4	16.3	25.4	27.9	25.7
Totals	99.9	100.0	100.0	100.1	100.0	100.0
Number of Group Use Units	259	231	238	204	207	258

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Table 4 continued,

	May Sample					
Independent or Parallel	40.9	24.2	30.5	27.0	20.0	24.7
Associative	33.6	42.6	37.9	35.5	63.8	29.0
Coordinated	0.0	13.9	0.8	13.7	2.0	9.4
Teacher Participating but not Controlling	0.3	3.6	0.0	0.5	1.0	7.1
Teacher Controlling	25.2	15.7	30.9	23.2	12.2	29.8
Totals	100.0	100.0	100.1	99.9	99.9	100.0
Number of Group Use Units	271	232	245	217	243	219

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Independent and Parallel Play In November, type of play area controlled the percentage of independent or parallel play (Table 5). For all sex-typed groups in all classes, there was a higher percentage of independent play in the boys' area than in the girls' area. In May there was no simple area difference except perhaps for mixed sex-typed groups. Instead, the effect of the match between play area and sex of group of children outweighed the effects of area alone. Boys in the girls' area engaged in relatively more independent play than did girls or mixed groups in this same area. Conversely, girls' groups engaged in more independent play in the boys' area than did boys but only in the two classes with women teachers. With men teachers, there was no difference in the boys' area. This result represented the only instance where the children changed their behavior in some consistent way from November to May.

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TABLE 5

Percent of All Play by a Given Sex-Typed Group Classified as Independent or Parallel

Sex-Typed Group	Male Teachers' Class		Female Teachers' Class		Mixed Teachers'	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area	Boys' Area	Girls' Area
NOVEMBER SAMPLE						
Boys	62	45	37	18	10	22
Girls	33	24	45	8	73	19
Mixed	38	9	47	19	12	11
MAY SAMPLE						
Boys	39	52	36	55	12	11
Girls	40	27	42	37	54	20
Mixed	45	14	17	15	37	17

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TABLE 6

Percent of All Play by a Given Sex-Typed Group Classified as Associative

Sex-Typed Groups	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys Area	Girls Area	Boys Area	Girls Area	Boys Area	Girls Area
NOVEMBER SAMPLE						
Boys	4	29	41	48	73	69
Girls	19	39	9	28	20	38
Mixed	2	45	42	61	27	40
MAY SAMPLE						
Boys	31	30	38	35	78	33
Girls	41	43	25	25	18	23
Mixed	30	46	42	29	30	33

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Associative Play Clearly the effects of teacher team were far outweighed by the effects of play and sex-typed groups in determining rates of independent play. By contrast, associative play displayed a large teacher team effect.(Table 6) Both in November and May and regardless of play area, girls engaged in more associative play than boys with the male teacher teams while boys engeged in more associative play than girls with the all female team and with the mixed team.

Coordinated Play Turning to coordinated play it was clear that group and area once again controlled rate differences (Table 7). There was virtually no coordinated play in the boys area. It was equally clear that coordinated play was restricted to groups containing girls. While boys knew how to "play house" (the most common type of coordinated play), they never did so when by themselves in the girls' area. This was true despite the fact that they often used the girls' area as much or more than did the girls (Table 2).

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TABLE 7

Percent of All Play by a Given Sex-Typed Group Classified as Coordinated

Sex-Typed Groups	Male Teachers Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys' Area	Girls' Area	Boys' Area	Girls' Area	Boys' Area	Girls' Area
NOVEMBER SAMPLE						
Boys	0	3	1	0	0	0
Girls	0	8	0	51	0	13
Mixed	0	16	0	13	0	11
MAY SAMPLE						
Boys	0	4	0	0	1	0
Girls	0	8	0	30	0	18
Mixed	0	22	3	13	10	5

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CONCLUSION

This research sought to ascertain how much boys, girls or groups of children, predominately of one sex or the other, used play areas with boys' or girls' toys in the classes with men or women teachers. It also attempted to discover what combinations of teachers, children, and play area led to the most advanced types of play structure.

There were no significant differences between classes or area in the amount of time required to record 15 minutes of video tape, recording only at times when two or more persons were in a given play area. Since there were no absolute differences in amount of area use, the issue became one of differences in use by boys versus girls or by male teachers versus women teachers.

First it was reported that children in all classes used the are with same sexed toys more than the area with opposite-sexed toys. Thus, in their unfettered everyday play, lower class four-year-olds exhibited the sex-typed preferences found previously using more structured measures of sex-typing (e.g., Hartup and Zook, 1960).

Overall, boys' groups both large and small used the play areas more than girls' groups. They used the boys' area much more than did girls and, in addition, often used the girls' area as much or even more than the girls. While there were no data from other parts of the classrooms, girls may have preferred to play at tables where there were crayons and puzzles or the loft area.

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Turning to the teacher data, teacher team, it was found that teacers were present in each play area of all classes less than half the time. However, despite their intermittent presence in the areas, their presence in the room appears to have been felt. Teacher teams had the effect of depressing the use of both areas by children of their own sex, or increasing use by children of the opposite sex or both. In reaching this conclusion the mixed teachers' class was interpreted as a second female teachers' class. The justification was that all the children in this class, when asked in May, considered one of the females in this class as their teacher. By themselves, the data do not permit one to tell whether teachers both increase area use by children of the opposite sex and depress use by children of their own sex. However, in this regard, it is interesting to note that teachers showed some tendency to spend relatively more time in the area with toys of their own sex and that this same area was used more in a cross-over fashion than was the other area. That is, girls crossed-over more in a male teacher class and boys crossed over more in a female teacher class.

Regretably, most of these facts are subject to at least two interpretations. One is that a kind of cross-sex attraction existed between teachers and children. Men teachers attracted girls to block and truck play. Women teachers attracted boys to playing family or dressing up in clothes in the girls' area. However such attraction must be based on processes more subtle than simple direct attraction by teacher presence in their same-sex area. While these were trends for teachers to use the same-sex area more, the differences were not large and there was considerable individual variation.

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Another explanation for the area use patterns is that they reflected a kind of "negative image" of what was happening elsewhere in the classroom. Since the teachers were not present in the areas much of the time, perhaps they were interacting with children of their own sex elsewhere in the classroom. Thus the ignored opposite-sex children, being relatively on their own played more in the play areas studied. Other data emerging from this research project should assist in choosing between these explanations. Thus if teachers were interacting more with children of their own sex they might continue to do so during the time they spent in the play areas.

The structure of play in the play areas also was influenced by the teacher teams. The effect was for the relative amounts of "associative" play, the model type of play in almost every instance. Both in November and May, groups of children opposite in sex to their teacher team engaged in more associative play than did children of the same sex as the teacher team. This result parallels that discussed earlier regarding area use. Thus, children of the sex opposite that of the teachers both played in the areas more and used them more for purposes of associative play. "Associative" play meant that the children were playing with one another rather than solely or primarily with the play materials or with the teacher. "Coordinated" play was a still more integrated type of play since the children not only related to one another but coordinated their activities by division of roles between the participants. However, coordinated play did not occur much anywhere, and when it did occur, it was restricted to the girls' area and required the participation of girls in the group.

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Thus, associative play represented the most advanced social activity between the children, that occurred with substantial frequency. And its relative occurrence was greater for children opposite the sex of the teacher team than for children of the same sex as the teacher team.

If children of the same sex as the teachers were engaged less in associative play, in what type of play were they engaged more? There was no clear answer in these data because all other types of play were strongly affected by area or by the interaction of area and sex-typed group in all classes. Thus, in November independent play was predominantly a boys' area phenonenon. By May, children engaged in more independent play when they were in the area with toys preferred by children of the other sex. Teacher controlled play was more difficult to analyse because of necessary controls on teacher presence rates. However, analyses not reported here, showed that children the same sex as the teacher team engaged in no more activity controlled by their teachers than did children of the opposite sex.

So the pattern of results for the structure of play was not unlike that for area use. While teacher teams affected the structure of play in their classes, their effects were commonly outweighed by the effects of the play area itself, and by the sex of the group that was playing in that area. When teacher team effects did occur, they favored children of the opposite sex.

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Children of the opposite sex used the areas more, crossed over to the opposite sexed area and played more associatively than children of the same sex of the teacher.

The patterning in this data, if correctly interpreted, is rather contrary to that in much social learning literature. Instead of stressing the importance of value of same-sex teacher models for young children, it points to the importance of the cross-sex teacher-child relationship. A truly mised teacher team, one where the boys name the female as their teacher and the girls name the man should achieve the maximum use of boys' and girls' toys by children of each sex, and the maximum amount of associative play between the children.

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INTRODUCTION

PART II. Intellectual Performance, Conservation of Gender Identity, and Congitive Style by Preschool Children with Teachers Differing in Sex.

Part II considers the effects of men and women teacher teams on day-care children's performance on tests of cognitive skills and cognitive style. No previous studies have compared classes with teachers differing in sex on the intellectual performance of preschool-aged children. Therefore, with no basis for predicting which tests would be influenced by teacher's sex, an attempt was made to select a variety of tests representative of a variety of persuasions on the nature of intellectual development. First subtests from conventional intelligence tests were included to represent the view that intellectual development is an accretional process in which the position of one child relative to others may remain fairly stable. Second, a measure of conservation was included to represent the view that the central structure of intelligence changes with age. Third, a measure of cognitive style was included to represent the view that performance on different kinds of tasks is influened by the style with which it is approached. Does the subject scan the information available quickly or slowly? - completely or incompletely?

The choice of specific tests in each of these areas was based on previous work, mostly with older children. Many studies have been done comparing boys' and girls' performance on IQ subtests.

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Sigel (1965) reported that of 18 studies of quantitative skill, boys scored higher in ten, and girls only in one. Seven showed no differences. Maccoby (1966), in another review paper, concluded that, throughout the preschool years, girls exceed boys in most aspects of verbal performance. She also concluded that boys do not excel in spatial skills until the early elementary years.

Based on these findings, two tests of quantitative-spatial and two tests of verbal-linguistic skill were selected. The Arithmetic and Block Design Subtests from the Wechsler Preschool and Primary Scale of Intelligence (WPPSI) were the quantitative-spatial measures. The Illinois Test of Psycholinguistic Abilities (ITPA) Gramatical Closure Scale and the WPPSI Vocabulary Scale were the verbal-linguistic measures. In addition to studying sex differences, it will be noted whether men teachers improve performance on quantitative measures and women teachers improve performance on verbal measures.

Poor children have difficulty communicating verbally with middle class test administrators (Ginsburg, 1972). To test the influence of the social-communicative situation on performance, all subjects received a fifth subtest either before or after all the others. This subtest, the ITPA Visual Reception Subtest, has almost no verbal instructions and can be answered simply by pointing at one of several pictures. The results of this additional manipulation will be reported at a later time.

The clear choice of a measure of conservation skill for this research was the Boy-Girl Identity Task developed by Emmerich and Kohlberg (Kohlberg, 1966).

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Children are asked whether gender identity is conserved when, for example, a boy puts on girls' clothes. While Kohlberg sees the failure of preschool children to conserve gender identity as a reflection of broad structural limitations on their thinking, the acquisition of belief in invarient gender may be quite different from the aquisition of belief in invariant mass or volume or number. Each day the child experiences arrays of objects being moved about and liquids being poured from one container to another. By contrast, he may have almost no direct experience with the morphological differences from which to extract the idea of gender permanence.

Concerning cognitive style, Yando and Kagan (1968) found that first graders placed with reflective teachers became more reflective during the school year than did those placed with impulsive teachers. While the popular stereotype that women are more impulsive than men does not seem to have been supported in research, Witkin did find related differences favoring men in other cognitive style dimensions (see Pick and Pick, 1970, p.808-809). Thus it was advisable to see whether men and women teachers had any influence on children's impulsivity-reflectivity.

Most measures of cognitive style were developed for children beyond their fifth birthday. However, recently John Wright published a version of Kagan's "Matching Familiar Figures" test appropriate for preschool-aged children. The Kansas Reflection-Impulsivity Scale (KRISP) is still in the development phase and thus standardization data on it are limited (Wright, 1971).

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Wright describes the reflective child as one who typically responds slowly, carefully, accurately and with precision in tasks where response uncertainty is initially high and speed and accuracy are negatively related. Conversely, the impulsive child is one who responds quickly, but with a high error rate. It follows that the reflective behavior would be a handicap in tasks requiring spontaneous behavior such as dramatics and art, and impulsive behavior would be a handicap in tasks involving careful and precise analysis such as reading, mathematics and spelling.

METHOD

Subjects, Setting and Experimenters. The subjects and setting were identical to those described in Part I of this report. Experimenters were six female and two male undergraduates trained in administering each test.

Design. A post-test only design (Ross and Smith, 1965) was used. This design employs random assignment of children to classrooms before the start of the school year. It allows one to attribute differences on tests given at the end of the school year either to the experimental variable (sex of teacher team) or to uncontrolled variables. This design was chosen because 1) it avoids overtesting the children, 2) it avoids alerting subjects to the matters under study at the beginning of the year and 3) it is relatively economical.

Each child received the IQ subtests at one session and the KRISP and Identity Tasks at a separate session on another day.

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The IQ subtests were always administered in the following order: Vocabulary, Arithmetic, Grammatical Closure, Block Design. Half the children received the Visual Perception subtest before this battery and the other half received after. Half the children received the KRISP first and the other half received the Identity Task first. The IQ subtests were administered entirely by female experimenters. Sex of experimenter and sex of child was completely counterbalanced for the KRISP and Identity Task.

Procedure. Subjects were tested individually in small rooms at the day care center. All tests were administered, as far as the design allowed, in accordance with the test manuals provided. However, even though the IQ battery was shorter than those generally employed, pretesting indicated that the children tended to be afraid and nonresponsive. Therefore, the procedure was modified somewhat to permit the experimenters to establish more rapport at the start of the testing and reinforce all cooperation with verbal praise.

RESULTS

IQ Subtests. Mean scores of boys and girls on each IQ subtest are given in Table 8. In every class boys scored higher than girls on Arithmetic, Block Design and Vocabulary.

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TABLE 8

Mean Scores on IQ Subtests for Boys and Girls in each Class.

Subtest	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys	Girls	Boys	Girls	Boys	Girls
WPPSI Arithmetic	9.9	7.7	9.8	8.8	9.4	7.8
WPPSI Block Design	7.5	6.9	6.0	5.9	8.5	4.8
ITPA Grammatical Closure	11.5	9.4	11.4	10.3	13.1	7.0
ITPA Visual Reception	13.0	13.3	16.5	14.6	12.4	12.3
WPPSI Vocabulary	17.9	11.9	12.6	13.5	14.9	7.4
Total of above Subtests	59.6	49.2	56.3	53.3	57.0	39.1
N	8	10	8	8	8	8

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In addition, boys scored higher than girls in two of the three classes on the remaining subtests, Visual Reception and Vocabulary. Two factor (Class and Sex) analyses of variance for each subtest showed that the main effect for sex achieved statistical significance ($p < .05$) only for Grammatical Closure, Vocabulary and for the total score of the subtests combined. Thus the result was that while boys scored higher than girls on all tests, the differences were large enough to achieve ... significance only for the linguistic measures. No subtest showed a main effect for Class and only for Vocabulary did the Class and Sex interaction approach statistical significance ($p < .10$). In general, boys scored significantly higher than girls on Vocabulary. But in the female teachers' class, the girls scored higher than the boys.

Boy-Girl Identity Task. The percentage of conserving responses the children provided to the various types of questions on the Boy-Girl Identity Task are shown in Table 9.

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TABLE 9

Percentage of Gender Identity Conserving Responses to Questions [1]

from the Boy-Girl Identity Task.

Could the depicted child change sex if he or she:	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys	Girls	Boys	Girls	Boys	Girls
Wanted to?	43	60	63	50	50	41
Played with toys and did things children of the opposite sex do? (Actions described verbally)	21	25	31	39	40	17
Changed type of clothes, hair length or both. (Changes shown using pictures)	17	12	14	11	20	25
N	7	10	8	9	10	6

1 Actually groups of questions. There were two "wanted to," two "Play with toys," and six "change in type of clothes" questions. Thus base of percentages was N x the number of questions in each group.

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In all classes children of each sex conserved most often when they were asked if a pictured boy could become a girl if he "really wants to be". However, note that the observed rate of conserving here was about 50% or that expected on the basis of random guessing. For the other types of questions, and particularly for those questions where the children witnessed the depicted child change in appearance, the proportion of conserving responses was well below the chance level. These four-year olds were not simply unsure. They knew that if a girl put on boy clothes or played with trucks and did boy things, she became a boy.

However, neither the sex of the teacher team nor the sex of the child affected these patterns. Two way analysis of variance for each group of questions yielded no significant main or interaction effects.

KRISP. Of the 51 children studied, 12 were reflective and 12 were impulsive using the present mean time to first response (5.4 seconds) and mean total errors in ten items (7.2 errors) to divide the children into groups. Thus 47% of the children were classifiable in Wright's (1971) data which was considerably less than the 75% classifiable. Separate analyses of variance for the time and error data found no significant Class or Sex effects. However, in agreement with the IQ subtest results, it is interesting to note that in all classes boys averaged fewer errors in ten items than did girls.

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CONCLUSION

One year's exposure to teacher teams varying in sex did not influence the cognitive performance of day care children aged four. The result is not really surprising given unreported data from this study showing that the children were not instructed very much by teachers of either sex. Such effects may require quantatively more teacher-child interaction.

The striking finding from the test performances was the tendency for boys in every classroom to score higher than girls both on conventional IQ measures and on the cognitive style measure. Furthermore the differences reached statistical significance only for tests of linguistic ability, tests on which girls are supposed to score higher than boys! These results might be attributed to the fact that the IQ battery was administered to all children by female experimenters. However, this explanation seems unlikely since boys performed more accurately on KRISP also, and here sex of experimenter and child were counterbalanced. Perhaps preschool boys and girls simply exhibited different skill differences than do elementary school children who have had several years of exposure to women teachers. However, the previous evidence seems to point toward girls' superiority in linguistic skills from the time of speaking their first word onwards (Maccoby, 1966).

Perhaps one should think of the results as reflective of a day care center with men teachers "around" rather than as three classes with teachers differing in sex. In this view, boys' higher performance could be attributed to the presence of men models in the setting.

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Several explanations are possible but results should at least surprise and thus inspire further work.

Despite the lack of teacher effects, the Boy-Girl Identity data require some discussion. Rather than leading one to conclude that four-year-olds do not conserve gender identity, one may conclude that they do couserve but by different rules. When a child has on pants and short hair, the children would say consistently that he is a boy, no matter what his genitalia look like.

As was suggested in the introduction, the problem is that gender identity is not a good test of conservation skill, since the information that would allow the child to either conserve or fail to conserve is quite literally covered up in our culture!

For different reasons, the KRISP results are not very satisfying either. Wright's (1971) standardization sample of children of unspecified social characteristics reported median error and time scores, which if used on the present data, would have resulted in finding that almost all classifiable children were impulsive. Perhaps Wright's sample was middle class. In this case, our results point to large class differences and indicate the importance of the examination of social characteristics of subjects in the further development of the KRISP.

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INTRODUCTION

PART III. The Sex-typed Classification of School Objects by Preschool Children in Classes with Teachers Differing in Sex.

Perhaps the most striking evidence concerning the effect of sex of teacher or children concerns the classification of school objects. Kagan (1964) found that second and third grade children viewed school materials such as books, blocks and desks as feminine. Presumably they had been influenced by the feminine atmosphere of the schools.

The present research sought to ascertain whether these attitudes regarding school objects were present at entry into the classroom. The children were tested in September upon their first arrival in a pre-school situation. In addition the study sought to ascertain the effect of one year's exposure to men or women teachers by testing the children a second time in April.

METHOD

Subjects, Setting and Experimenters. The Subjects and setting were described in Part I. The experimenters were two male and two female undergraduates trained in the use of the test.

Design. The test was administered to all children in all classes in September and again in May. Before the start of the school year, children had been assigned at random to teacher team subject to restrictions of balanced sex ratios, and age (see part I). Each male and female experimenter tested equal numbers of boys and girls in each classroom.

Test Instrument. Pretest data from children not involved in this study revealed that four-year-olds could not perform the task following Kagan's procedures.

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Therefore a new measure was devised and is called the School Object Sex-typing Index for Preschoolers (SOSTIP). Children are shown a series of pictures and asked what each is, who belongs in it, or who uses it, having previously been shown to answer in terms of sex of user. Four pictures depicted male sex-typed objects and 12 depicted school-related objects. All pictures selected for SOSTIP had been correctly identified by preschoolers in pilot work.

While the index was based on Kagan's (1964) measure, it differs in several important ways: (1) Nonsense syllables were not used; instead the pictures were directly labeled (2) items were presented only once (3) there was no use of projective technique or theory.

Procedure. The experimenter introduced the measure as a game and briefly conversed with the children before testing began. The children were told that they wo ld see many pretty pictures. Then, presenting a picture of a man, the experimenter said: "Do you know what this is?" A picture of a woman was shown and the question was repeated. "That was very good. Now I'm going to show you some other pictures and I'd like you to tell me two things: What the picture is and who belongs in it, a 'boy' or a 'girl' (the terms used by each child to identity the man and woman were used here). In the order shown, the pictures were a kitchen, a gas station, a school bus, a classroom, a truck, and a library.

The experimenter than asked the child to tell "who used" each object depicted: a blackboard, a baseball, an iron, and board, a pencil, numbers, a doll, an easel and a book.

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Finally the experimenter showed pictures of people engaged in various activities. In each picture the sex of the person was ambiguous. The activities are apparent from the questions asked: "Who's serving food?", "Who's reading?", "Who's carrying paint?", "Who's building blocks?", "Who's leaving school?", and "Who's drawing?"

Often children would respond that both boys and girls "belonged", or "used" and object or "did" a given activity. "Both" responses were not discouraged and were tabulated in the analysis.

RESULTS

From the September testing, it was clear that sex-role stereotypes were well formed at the time these four-year-old lower class children first entered a school setting. In all classes both boys and girls associated all male-stereotyped items with males (trucks, baseball and bat, carrying paint, gas station) and all female-stereotyped items with females (doll, iron and board, serving food, and kitchen). These findings are consistent with those of Hartup and Zook (1960).

Table 10 shows the children's responses to the 12 school items. The significance of mean differences in Table 10 was tested in three Class by Sex analyses of variance; one for each response, with testing session as a repeated measured.

Boys gave more boy responses than did girls ($p < .01$) and girls gave more girl responses than did boys ($p < .01$). Test score results changed significantly from September to April. In April the children gave fewer "Girl" responses ($p = .05$) and more "Both" responses ($p < .01$).

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Finally one interaction regarding class approached statistical significance: While "Girl" responses declined from September to May in the male and mixed teachers' class, they increased in the female teachers' class ($p < .10$).

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TABLE 10

Mean Number of "Boy", "Girl" and "Both" Responses on the School Object Sex-typing Index for Preschoolers

Response	Male Teachers' Class		Female Teachers' Class		Mixed Teachers' Class	
	Boys	Girls	Boys	Girls	Boys	Girls
September Testing						
"Boy"	6.5	3.8	6.4	4.7	5.2	4.4
"Girl"	3.2	5.1	2.7	4.1	2.9	5.8
"Both"	2.3	3.1	2.9	3.2	3.9	1.8
April Testing						
"Boy"	5.5	3.7	6.1	3.4	4.0	4.8
"Girl"	1.5	2.9	3.0	4.4	2.3	4.4
"Both"	5.0	5.4	2.7	4.1	5.6	2.8
N	6	10	7	9	8	5

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CONCLUSION

Using a new index assessing sex-typing of school objects, children in a preschool setting judged school objects to be used by persons of their own sex. However, from September to April, there was a decline in "Boy" and "Girl" responses and an increase in "Both" responses. The children appear to have realized that the school setting is one appropriate to children of each sex. However, contrary to the pattern in the male and mixed teachers' classes, "Girl" responses increased in the female teachers' class. Perhaps one sees the beginnings of childrens tendency to label the school environment as feminine under the influence of female teachers (Kagan, 1964). For reasons which are not understood, there was no special tendency for children with men teachers to lable school objects as masculine.

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REFERENCES FOR PART III

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